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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/800,111	03/12/2004	Mark R. Ayres	495812005700	8922

25226 7590 06/28/2007
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EXAMINER	
WYATT, KEVIN S	

ART UNIT	PAPER NUMBER
2878	

MAIL DATE	DELIVERY MODE
06/28/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/800,111	AYRES, MARK R.	
	Examiner	Art Unit	
	Kevin Wyatt	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04/19/2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the Amendment after non-final and remarks filed on 04/19/2007. Currently, claims 1-32 are pending.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 6, 8, 10, 12, 16, 18-20, 24, 26, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsutsumi (Publication No. U.S. 2002/0031290 A1).

Regarding claim 1, Tsutsumi shows in Figs. 1-2 and 8-9, a system for measuring a characteristic of an optical article, comprising: a light source (30, i.e., semiconductor laser) for producing light; an optical element (32, i.e., first lens) for focusing the light along a probe path to converge at a reference location (a selected location on microstrip (24)) associated with an expected position of an optical article (combination of monocrystal (22) and microstrip (24)), the reference location within the optical article or on a surface thereof; a sensor (40, i.e., photosensor or photosensors (40a) and (40b) in Fig. 2) for detecting the light from the reference location, wherein the sensor generates signals associated with an intensity and position of the light received for individual spots of received light (individual points on the microstrip); and a processor (OS, i.e.,

oscilloscope and operation circuit (42) in Fig. 2), wherein the processor is configured to receive signals from the sensor (40, i.e., photosensor) associated with a single spot of received light and determine a deflection angle and a direction of the deflection angle of the light from the probe path (paragraph 0066).

Regarding claim 2, Tsutsumi shows in Figs. 1-2 and 9, that the reference location location (a selected location on microstrip (24)) is associated with an expected position of the surface of the optical article (combination of monocrystal (22) and microstrip (24)).

Regarding claim 3, Tsutsumi shows in Figs. 1-2 and 9, that the reference location location (a selected location on microstrip (24)) is associated with an expected position within the optical article (combination of monocrystal (22) and microstrip (24)).

Regarding claim 6, Tsutsumi discloses that the processor is further configured to determine a characteristic of the optical article based on the deflection angle of the light at multiple locations of the optical article (paragraph 0066 indicates that due to vibrations of the magnetic domain walls caused by the microwaves produces spatial distribution of refraction changes, thus determining characteristics of the microstrip at different locations).

Regarding claim 8, Tsutsumi discloses that the characteristic includes an index of refraction value (paragraph 0066, lines 5-7).

Regarding claim 10, Tsutsumi shows in Fig. 2, that the sensor includes at least two segments and is configured to generate a signal associated with the intensity of light received at each of the at least two segments.

Regarding claim 12, Tsutsumi discloses that the sensor includes a position sensitive diode device.

Regarding claim 16, Tsutsumi shows in Figs. 1-2 and 9, that the sensor is positioned to detect light passing through the reference location.

Regarding claim 18, Tsutsumi discloses a method for measuring a characteristic of an optical article, comprising: illuminating an optical article (combination of monocrystal (22) and microstrip (24)) with a focused beam of light along a probe path, wherein the focused beam converges within the optical article or on a surface thereof; detecting the light with a sensor (40, i.e., photosensor or photosensors (40a) and (40b) in Fig. 2) after the light interacts with the optical article (combination of monocrystal (22) and microstrip (24))(paragraph 0044, lines 9-14); determining a deflection angle and a direction of the deflection angle of the beam of light with respect to the probe path after interacting with the optical article for a single spot of received light (paragraph 0065, lines 16-20); and determining a characteristic (index of refraction, paragraph 0066, lines 5-7) of the optical article based on the deflection angle.

Regarding claim 19, Tsutsumi discloses a method further including scanning multiple positions of the optical article with the focused beam of light to determine deflection angles at multiple positions of the optical article (combination of monocrystal (22) and microstrip (24)) (paragraph 0065, lines 16-20 and paragraph 0066, lines 11-14).

Regarding claim 20, Tsutsumi discloses a method further including using the multiple deflection angles to determine a characteristic (index of refraction, paragraph

0066, lines 5-7) of the optical article.

Regarding claim 24, Tsutsumi shows in Fig. 2, a method further including confocally imaging the light after the light interacts with the optical article (combination of monocrystal (22) and microstrip (24)).

Regarding claim 26, Tsutsumi discloses a method for measuring a characteristic of an optical article, comprising: scanning an optical article (combination of monocrystal (22) and microstrip (24)) with a focused beam of light; detecting a deflection angle and a direction of the deflection angle of the focused beam of light from the optical article at multiple scan positions, wherein the deflection angle and a direction of the deflection angle for each of the multiple scan positions is determined from a single spot of light, and for each of the multiple scan positions the focused beam converges within the optical article or on a surface thereof (paragraph 0065, lines 16-20 and paragraph 0066, lines 11-14); and determining a characteristic of the optical article based on the deflection angles at the multiple scan positions.

Regarding claim 29, Tsutsumi shows in Fig. 2 that the focused beam of light from the optical article passes through a confocal imaging system.

4. Claims 1-13, 17-23, 26-28, and 30-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Opsal (U.S. Patent No. 5,042,952).

Regarding claim 1, Opsal shows in Figs. 1-2, a system for measuring a characteristic of an optical article (22, i.e., sample), comprising: a light source (26 or 40, i.e., laser) for producing light; an optical element (36, i.e., objective) for focusing the light along a probe path to a reference location associated with an expected position of an

optical article; a sensor (50, i.e., photodetector) for detecting the light from the reference location, wherein the sensor generates signals associated with an intensity and position of the light received (col. 10, lines 28-34); and a processor (32), wherein the processor is configured to receive the signals from the sensor (50, i.e., photodetector) and determine a deflection angle and a direction of the deflection angle of the light from the probe path.

Regarding claim 2, Opsal shows in Figs. 1-2, that the reference location is associated with an expected position of a surface of the optical article (22, i.e., sample).

Regarding claim 3, Opsal shows in Figs. 1-2, that the reference location is associated with an expected position within the optical article (22, i.e., sample).

Regarding claim 4, Opsal shows in Figs. 1-2, the system of claim 1, including a stage (24, i.e., movable stage) for translating an optical article (22, i.e., sample) relative to the light source (26 or 40, i.e., laser) and the probe path in at least one dimension.

Regarding claim 5, Opsal discloses in addition to the system of claim 1, further including a stage (24, i.e., movable stage) for translating an optical article relative to the light source and the probe path in three dimensions (col. 16, lines 20-24).

Regarding claim 6, Opsal shows in Figs. 1-2, wherein the processor (32) is further configured to determine a characteristic of the optical article (22, i.e., sample) based on the deflection angle of the light at multiple locations of the optical article (col. 16, lines 31-37).

Regarding claim 7, Opsal discloses that the characteristic includes one or more of surface flatness, a divot feature, or a peak feature of the optical article (col. 16, lines

31-37).

Regarding claim 8, Opsal discloses that the characteristic includes an index of refraction value (col. 9, lines 20-22).

Regarding claim 9, Opsal discloses the characteristic includes stored information (col. 10, lines 48-50).

Regarding claim 10, Opsal discloses that the sensor includes at least two segments and is configured to generate a signal associated with the intensity of light received at each of the at least two segments (col. 10, lines 8-10).

Regarding claim 11, Opsal discloses that the sensor includes a quadrant photodetector and is configured to generate a signal associated with the intensity of light received at each quadrant of the quadrant detector (col. 12, lines 58-62).

Regarding claim 12, Opsal discloses that the sensor (50a, i.e., photodetector) includes a position sensitive diode device.

Regarding claim 17, Opsal discloses that the sensor (50a, i.e., photodetector) is positioned to detect light reflected from the reference location.

Regarding claim 18, Opsal discloses a method for measuring a characteristic of an optical article (22, i.e., sample), comprising: illuminating an optical article with a focused beam of light along a probe path (col. 8, lines 48-53 and col. 10, lines 3-11); detecting the light with a sensor (50a, i.e., photodetector) after the light interacts with the optical article; determining a deflection angle and a direction of the deflection angle of the beam of light with respect to the probe path after interacting with the optical article (col. 5, lines 34-37); and determining a characteristic of the optical article based on the

deflection angle (col. 16, lines 31-37).

Regarding claim 19, Opsal discloses a method further including scanning multiple positions of the optical article with the focused beam of light to determine deflection angles at multiple positions of the optical article (col. 16, lines 31-37).

Regarding claim 20, Opsal discloses a method further including using the multiple deflection angles to determine a characteristic of the optical article (col. 16, lines 31-37).

Regarding claims 21-23 and 30-32, further including producing a surface relief pattern and surface plot from the multiple deflection angles (col. 7, lines 65-68 and col. 8, lines 1-5).

Regarding claim 27, Opsal shows in Figs. 1-2 a method wherein the scan is performed along a first and second dimensions the first and second dimension orthogonal to the path of the focused beam of light (col. 7, lines 65-68).

Regarding claim 28, Opsal discloses a method wherein the scan is performed along a third dimension, the third dimension parallel to the path of the focused beam of light (col. 16, lines 20-24).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 14-15, and 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsumi (Publication No. U.S. 2002/0031290 A1) in view of Migeotte (U.S. Patent No. 3,688,235).

Regarding claims 14-15, Tsutsumi discloses the claimed invention as stated above. Tsutsumi does not disclose a second optical element positioned to focus the light beam from the reference location to a pinhole filter between the second optical element and the sensor as recited in claim 14. In addition, Tsutsumi does not disclose the second optical element and pinhole filter are disposed in a confocal imaging configuration as recited in claim 15. Migeotte shows in Fig. 1 a second optical element (25, i.e., light-diffusing screen) positioned to focus the light beam from the reference location to a pinhole filter (26, i.e., screen) between the second optical element (25, i.e., light-diffusing screen) and the sensor (28, i.e., cell) in accordance with claim 14. Migeotte also shows in Fig. 1 the second optical element and pinhole filter (26, i.e., screen) are disposed in a confocal imaging configuration in accordance with claim 15. It would have been obvious to one skilled in the art to provide optical elements such as those provided in Migeotte to the device of Tsutsumi for the purpose of providing greater sensitivity and improved accuracy.

Regarding claim 25, Tsutsumi discloses the claimed invention as stated above. Tsutsumi does not disclose a method wherein the light is confocally filtered after the light interacts with the optical article. Migeotte shows in Fig. 1 a method wherein the light is confocally filtered after the light interacts with the optical article. It would have been obvious to one skilled in the art to provide optical elements such as those provided

in Migeotte to the device of Tsutsumi for the purpose of providing greater sensitivity and improved accuracy.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Opsal (U.S. Patent No. 5,042,952) in view of Fanton (U.S. Patent No. 5,181,080).

Regarding claim 13, Opsal discloses the claimed invention as stated above. Opsal does not explicitly disclose the position sensitive diode device generates two signals, a first signal associated with a location of an intensity centroid along one direction and a second signal associated with a location of an intensity centroid along a second direction, the second direction orthogonal to the first direction. Fanton discloses or shows a position sensitive diode (40, i.e., detector) device generates two signals, a first signal associated with a location of an intensity centroid along one direction and a second signal associated with a location of an intensity centroid along a second direction, the second direction orthogonal to the first direction (col. 4, lines 35-50). It would have been obvious to one skilled in the art to provide a sensor such as one disclosed in Fanton to the device of Opsal for the purpose of providing information on surface characteristics in greater detail.

Response to Arguments

8. Applicant's arguments, see page 4, filed 04/19/2007, with respect to claims 4 and 17 have been fully considered and are persuasive. The rejection of claims 4 and 17 as being anticipated by Tsutsumi (Publication No. U.S. 2002/0031290 A1) has been withdrawn.

9. Applicant's remaining arguments filed 04/19/2007 have been fully considered but they are not persuasive.

In response to applicant's arguments regarding claim 1, that the disclosure of Tsutsumi does not disclose the determination of deflection angle from a signal generated by the sensor or determining a direction of the deflection angle, the examiner disagrees. Tsutsumi indicates in Fig. 9 that the direction of angle deflection is determined by which direction sensor 40 must be adjusted (towards the center) in order for the detected light to produce the signal having the greatest intensity.

In response to applicant's arguments regarding claim 1, Opsal does not disclose that the direction of the beam deflection is determined, the examiner disagrees. The applicant at least acknowledges that the "extent" or magnitude of the beam deflection is disclosed. However, col. 12, lines 60-66 also points out that the detector measures the beam fluctuations (due to periodic changes in the index of refraction) across its surface in which direction of deflection from one beam fluctuation to another may be determined by the processor simply by measuring extent or magnitude of each deflection.

In response to applicant's arguments regarding claim 28, that Opsal fails to disclose scanning in a third dimension, the examiner disagrees. Due to the fact that the probe beam measures characteristics of a sample at locations having different elevations (surface and subsurface features), the examiner maintains that Opsal does in fact disclose scanning in a third dimension.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Saito (U.S. Patent No. 4,952,027) discloses a device for measuring light absorption characteristics of a thin film spread on a liquid surface, including an optical device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Wyatt whose telephone number is (571)-272-5974. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571)-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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